

Short-Term Prediction of Inpatient Violence in Locked Psychiatric Wards in Japan: An Epidemiologic Study

Seiji SHIMOSATO (sshimos@shinshu-u.ac.jp),^{1*} Hironori NISHITANI,² Kenya MATSUMOTO,³ Nami KONISHI,⁴ Hiroyasu ISHIKAWA,⁵ Yoshimitsu HIEJIMA⁶

¹ Institute of Health Sciences, Shinshu University Asahi, Matsumoto City, Nagano, Japan

² National Hospital Organization Ryukyu Psychiatric Center, Okinawa, Japan

³ Faculty of Nursing, Kyoto Tachibana University, Kyoto, Japan

⁴ Psychiatric and mental health nursing, Department of human health science, Graduate school of medicine, Kyoto university, Kyoto, Japan

⁵ Tokyo Metropolitan Matsuzawa Hospital, Tokyo, Japan

⁶ Graduate School of Healthcare Tokyo Healthcare University, Japan

Received: Jan 28, 2015 Accepted: May 1, 2015

Abstract

Purpose: Violence in psychiatric hospital wards in Japan is not well understood, and the risk factors for identification of violent patients have not been established. The goal of this study was to develop strategies for short-term prediction of violence based on behavioral profiles. *Methods:* Demographic characteristics, diagnoses, psychiatric symptoms and social skills were analyzed in 534 inpatients in seven closed wards of four psychiatric hospitals. The behavior of these subjects was observed using the Brøset Violence Checklist (BVC). *Results:* Ninety-two subjects were involved in 164 incidents of violence. Logistic regression analysis suggested that a past history of violence, significant dysthymia, and a BVC score of 1 or higher were risk factors for violence. *Discussion and Conclusion:* Violence in psychiatric wards can be predicted using background factors including a past history of violence, a lack of negative symptoms, and dysphoria, in combination with a BVC score of 1 or more. Prevention of violence may be achieved with careful attention to the identified risk factors.

Keywords: Forecasting, inpatients, risk assessment, risk factors, violence,

1. Introduction

Clinical aggressiveness and violence among patients in psychiatric hospitals are major matters of concern.¹⁻³ Predictive indices are important in violence prevention, and long-term predictive factors for violence include criminal records, age, gender, and history of drug abuse.^{4,5} Regarding psychiatric factors, it's popularly thought that major mental disorder is one of risk factor for violence, but some view this date as questionable⁶. Anyway short-term prediction of violence is important with regard to inpatients.⁷⁻¹⁰ Among the methods used to predict violence, the Brøset Violence Checklist (BVC) developed by Alvmik et al.^{11,12} is one useful tool for prediction of violence within 24 hours. The checklist is based on six behavioral indicators, and is mainly used for predicting physical violence in secure units and admission wards.^{13,14}

In Japan, there are typically 40 or more patients per ward in a common psychiatric hospital, irrespective of

their condition being in an acute or chronic phase. As a result, patients who may or may not have problems with violence are pooled in the same ward. Evaluation instruments to prevent violence are mainly based on clinical criteria, and few studies have examined short-term prediction of violence. Therefore, assessment of both verbal and physical violence is of importance in secure units, psychiatric intensive care units (PICUs), and other clinical contexts. Therefore, the aims of this study were to describe the true state of violence attributable to inpatients in multiple psychiatric hospitals in Japan, and to determine short-term risk factors for violence using a prospective tracking method.

2. Methods

2.1 Patients

Data were collected from mentally troubled persons who were hospitalized in seven closed wards in four

psychiatric hospitals in Japan. In each ward, patients were followed up for six continuous months during the period from October 2004 to October 2005. The definition of violence was based on that given by Nijman,¹⁵ as "any verbal, non-verbal, or physical behavior that is threatening (others, or property), or physical behavior that actually does harm (others, or property)", but with exclusion of violence to self. Investigation of personal characteristics of the subjects was based on assessment of gender, age, diagnosis (ICD-10), quantity of psychopharmaceuticals (as related to chlorpromazine dose), past history of violence, and psychiatric symptoms (Brief Psychiatric Rating Scale: BPRS).¹⁶ Social skills were assessed using

the Japanese version of the Life Skills Profile (LSP).¹⁷

2.2 Methods

Subject behavior was assessed by nurses on daily duty at each ward using the BVC. The original version of the BVC includes six types of conduct: confusion, irritability, boisterousness, physical threats, verbal threats, and attacks with objects.^{11,12} Briefly, one point is given for each type of behavior observed over a defined period, and zero point for no relevant behavior observed for a certain particular behavior type. In this study, the BVC was completed by the nurse following completion of a duty-period; we noted that in the original description of the BVC, the data were

Table 1. Details of cases of violence (162 cases).

			n*	%
SOAS**	Aim of violence	1 destroy objects	18	11.1
		2 staff members	83	51.2
		3 other patients	58	35.8
		4 others	3	1.9
		total	162	100.0
	means of violence	1 verbal aggression	50	30.9
		2 The patient makes use of parts of his own body	83	51.2
		3 The patient makes use of ordinary and easily available objects, bites or tries to strangle someone	10	6.2
		4 The patient makes use of objects generally regarded as dangerous in an aggressive situation, such as knives, scissors, tools, etc	19	11.7
		total	162	100.0
	Result of violence	0 no damage	54	33.3
		1 Objects: Visible damage but still possible to make use of, Individuals: Felt threatened or brief pain(<10 min), no visible injury	82	50.6
		2 Objects: Damaged and needs to be replaced, Individuals: Physical pain >10 min or visible injury not requiring any treatment	16	9.9
		3 Individuals: Injury requiring some kind of treatment but not necessarily by a physician	8	4.9
		4 Individuals: Injury requiring some kind of treatment or supervision prescribed or performed by physician	2	1.2
		total	162	100

* number of cases

**Staff Observation Aggression Scale

recorded about 2.5 hours after the beginning of each nursing shift by the patient's primary nurse; however, in the clinical settings in the current study, there was insufficient time for nurses to complete the BVC during their working period. The original version of the BVC was translated into a Japanese version under license of the author and a pilot study was carried out to determine its validity.

When a case of violence occurred, it was classified by staff based on the scoring criteria on the Staff Observation Aggression Scale (SOAS). The SOAS, first published by Palmstierna and Wistedt in 1987,¹⁸ has subsequently been extended¹⁹ and revised.²⁰ Standard formats of reports on violence were compared among the target institutions in the study, and the SOAS classification was chosen to unify the approach; the evaluation items in the SOAS include the "means", "aim", and "results" of the violence.

2.3 Statistical Analysis

The characteristics and levels of violent incidents were analyzed to examine different aspects of the violence. Violence observed within three months after hospital admission and that occurred three months or more after admission were compared to evaluate the difference between acute-phase and long-term hospitalization. To determine risk factors for violence, a nested case-control study was performed. Patients who carried out a violent act within the study period were identified (the violence group or VG). When one violent patient appeared, we would select two non-violent patients (the non-violence group; NVG). Selection of non-violent patients was based on the date of hospitalization to incorporate the environmental factors. In Analysis I, variables that posed as potential risk factors for violence were examined in a logistic regression analysis of incidents of violence to identify factors related to violence. In Analysis II, variables associated with violence-related factors were identified using statistical tests. In the final or Analysis III, these variables were used as explanatory variables in a multivariate logistic regression analysis of incidents of violence. The backward method was used in variable selection. The statistical software package JMP 5.0 (SAS Institute) was used for all analyses.

3. Results

3.1 Background of subjects

The number of patients who satisfied the criteria for the study was 534 (males: 338, females: 196). Of these 534 patients, 266 were already hospitalized at the start of the study. The mean age of subjects was 46.2 ± 15.5 years old, and the mean dose of psychopharmaceuticals was 851.0 ± 850.1 mg/day. Based on diagnoses by the ICD-10 F code, 24, 31, 363, 61, 9, 3, 12, 19, and 7 patients were classified as F0, F1, F2, F3, F4, F5, F6, F7 and F8, respectively. There were 227 patients with a past history of violence, 61 with substance abuse, and 72 had previous criminal records. Of all 534 patients, 92 (males: 51, females: 41) had expressed violent acts, yielding an

incidence rate of 0.0022 cases/person/day.

3.2 Analyses of violent incidents

3.2.1 *Number of violent incidents:* Of the 92 patients causing a total of 162 violent incidents, 52 (56.5%), 22, 10, 4 and 4 patients incited/performed once, two, three, four, and five occasions, respectively.

3.2.2 *Description of violent incidents:* As shown in Table 1, the most frequent "aim" (target) of violence was a staff member (83 cases, 51.2%), followed by other patients (58 cases, 35.8%). Regarding "means", violence using a part the body (score: 2 points) accounted for 51.2% of the total number of incidents (83 cases), followed by verbal aggression (1 point; 50 cases, 31%). The "results" of violence in 83% of cases caused minor damage: these included no damage (0 points); visible but incomplete damage (object was still usable; 1 point); and threatening behavior or resulted with brief pain (<10 min) but without visible injury to an individual (2 points). However, 10 cases of violence requiring certain treatment of victims without a physician (3 points); or an injury requiring treatment or supervision prescribed or performed by a physician (4 points) (Table 1).

3.2.3 *Comparison by duration of hospitalization:* Violent incidents were categorized into two groups depending on whether they occurred before or after three months following hospital admission (Table 2). Violence towards staff was significantly more frequent within three months after admission ($\chi^2=9.40$, $p=0.024$); however, analysis with the χ^2 test; Table 2) indicated that physical attacks were more common after hospitalization of three months or more ($\chi^2=9.33$, $p=0.025$).

3.3 Risk factors

For each patient who had a violent incident during the study, two patients who were hospitalized nearest to the date of hospitalization of the violent person were included in the control group or NVG. Risk factors were compared between the VG ($n=92$) and NVG ($n=184$) (Table 3).

3.3.1 *Comparison of background characteristics:* Background factors in the VG and NVG were compared by the χ^2 -test. There were no significant differences in gender, age, and dose of psychopharmaceuticals between the two groups. However, 73 of the 92 VG patients had a past record of violence: a significantly ($\chi^2=25.88$, $p=0.000$) higher rate than that in the NVG.

3.3.2 *Psychiatric symptoms:* The five subscales of BPRS (Positive symptoms, negative symptoms, dysphoria, manic symptoms, and hypochondriacal symptoms)¹⁶ were compared

Table 2. Comparison based on duration of hospitalization*

		less than 3 months		over 3 months		χ^2 test
		n**	%	n	%	
Aim of violence	1	10	14.3	8	9.0	$\chi^2=9.41, p=0.024$
	2	42	60.0	38	42.7	
	3	16	22.9	42	47.2	
	4	2	2.9	1	1.1	
total		70	100.0	89	100.0	
Means of violence	1	25	35.7	25	28.1	$\chi^2=9.39, p=0.025$
	2	27	38.6	56	62.9	
	3	7	10.0	3	3.4	
	4	11	15.7	8	9.0	
total		70	100.0	89	100.0	
Result of violence	0	23	32.9	31	34.8	$\chi^2=5.75, p=0.218$
	1	32	45.7	50	56.2	
	2	10	14.3	6	6.7	
	3	5	7.1	3	3.4	
	4	0	0.0	2	2.2	
	total	70	100.0	89.0	100.0	

* Comparison between number less than 3 months and over 3 months.

** number of cases

The p values are for each: aims, means and results

between the two groups (VG vs NVG). Dysphoria ($t=5.07$, $p=0.000$), manic symptoms ($t=3.81$, $p=0.000$), and positive symptoms ($t=3.74$, $p=0.000$) were more severe in the VG; however, there were no significant differences in negative symptoms and hypochondriacal symptoms between the two groups.

3.3.3 Social skills: Analysis of the five subitems of the LSP showed that skills related to self-care ($t=-2.98$, $p=0.003$), non-turbulence ($t=-5.11$, $p=0.000$), socialization ($t=-2.28$, $p=0.023$), communication ($t=-4.21$, $p=0.000$), and responsibility ($t=-2.89$, $p=0.004$) were all significantly lower in the VG (Table 3).

3.3.4 Short-term prediction of behavior: For each incidence of violence, the highest BVC score for three shifts before the violence occurred was compared with data collected two weeks or more after the incident. The mean BVC score for 92 incidents just before violence occurred was 1.49 ± 1.18 (\pm SD) and the mean score two weeks or more after the incident was 0.34 ± 0.51 ; the BVC score just before the violent incident was significantly higher ($t=8.53$, $p<0.0001$) (Table 4).

3.3.5 Risk factors determined by logistic regression: Multivariate analysis showed that the lack of a past history of violence (Odds Ratio=3.27, 95% Confidence interval=0.17–1.04), a higher BPRS negative symptom score (Odds Ratio=15.95, 95% Confidence interval =0.02–0.22), a lower BPRS dysphoria score (Odds Ratio=0.03, 95% Confidence interval =-0.34–0.07), and zero BVC score (Odds Ratio=32.18, 95% Confidence interval =1.34–2.16) were predictive factors for non-violence. Conversely, patients with a past history of violence, no negative symptoms, positive dysphoria, and a BVC score of 1 or more were likely to become violent ($c^2=143.1$, $p<0.0001$) (Table 5).

4. Discussion

The incident rate in studies of violence is controversial, and it has been estimated to be about 10% in Japan, if only physical violence is considered.²¹ In this study, the incident rate of violence was 0.002 cases/person/day, or 17% of the total number of subjects (92/534). This value is similar to the 18% reported by Monahan et al.,²² although their study was restricted to physical violence. Therefore, the basal rate of violence in Japan appears to be lower than those in Europe and the United States (U.S.), given that our study included verbal violence. It has been pointed out that violence itself is relatively rare in Asia,²³ as confirmed by our present findings. It is worthy to note that the percentage of alcohol and drug

Table 3. Comparison of personal backgrounds

		Violent group (n*=92)		Non-violent group (n=184)		
		mean	SD	mean	SD	t-test
Age		45.0	14.4	46.5	13.5	p = 0.384
Quantity reduced by CP** (mg/day)		1104.8	952.3	903.4	906.7	p = 0.120
BPRS	Positive symptoms	7.99	5.52	5.34	5.10	p = 0.000
	Negative symptoms	5.00	4.86	4.68	5.01	p = 0.631
	Dysphoria	6.42	3.72	4.08	3.27	p = 0.000
	Manic symptoms	3.79	3.66	2.02	2.86	p = 0.000
	Hypochondriacal symptoms	2.77	2.30	2.54	1.93	p = 0.402
	total score	25.97	14.73	18.64	14.31	p = 0.000
LSP	self-care	2.61	0.67	2.88	0.68	p = 0.003
	non-turbulence	2.97	0.69	3.41	0.64	p = 0.000
	socialization	2.32	0.68	2.54	0.72	p = 0.023
	communication	3.07	0.76	3.45	0.63	p = 0.000
	responsibility	2.64	0.84	2.95	0.69	p = 0.004
		number of patient	%	number of patient	%	χ^2 test
Sex (number of patients)	Male	51	55.4	122	66.3	p = 0.07
	Female	41	44.6	62	33.7	
	total	92	100.0	184	100.0	
Diagnoses	Organic disorder	4	4.3	5	2.7	p = 0.86
	Alcohol, drugs	6	6.5	13	7.0	
	Schizophrenia	71	77.1	132	71.7	
	Mood disorder	5	5.4	17	9.2	
	Psychoneurosis	1	1.0	3	1.6	
	Behavior disorder	0	0.0	0	0.0	
	Personality disorder	3	3.2	6	3.2	
	Mental retardation	2	2.1	6	3.2	
	Developmental disorder	0	0.0	2	1.0	
	total	92	100.0	184	100.0	
History of alcohol and drug abuse (number of patients)	No	79	85.9	163	88.6	p = 0.517
	Yes	13	14.1	21	11.4	
	total	92	100.0	184	100.0	
History of violence (number of patients)	No	19	20.7	97	52.7	p < 0.001
	Yes	73	79.3	87	47.3	
	total	92	100.0	184	100.0	

* number of case

**Chlorpromazine

Comparison between violent group and non-violent group

t-test performed for those values for positive symptoms, negative symptoms, etc.

Chi-square test are performed for Sex, Diagnosis, History of alcohol and drug abuse, History of violence

Table 4. BVC total scores.

	Violence(n=91)		Non-violence(n=91)	t-test
	mean±SD	mean±SD		
BVC total score	1.49±1.18	0.34±0.51		t = 8.53, p < 0.001

*Broset Violence Checklist

abusers in our sample-population was approximately 12%, whereas that of Europe and the U.S. is reported to be as high as 33%.²⁴ Additionally, there is little ethnic strife or confrontation between religions in Japan,

whereas this issue may arise more frequently in Europe and the U.S. These differences may account for the lower incidence of violence in our patients.

Patients who had been in hospital for less than three

Table 5. Risk factors

	Estimate value*	χ^2	p	OR	95%CI	
Intercept	0.99	7.42	0.006		0.28	1.73
Past history of violence(No)	0.59	7.26	0.007	3.27	0.17	1.04
BPRS Negative symptom	0.12	5.56	0.018	15.96	0.02	0.23
BPRS Dysphoria	-0.20	8.51	0.003	0.03	-0.35	-0.07
BVC score: 0	1.74	69.67	<.001	32.18	1.35	2.17

AIC=71.57

 $\chi^2=143.1$ p<0.001

*The estimated value is for the logarithmic odds of nonviolence/violence.

Risk factors obtained by logistic regression analysis.

OR: Odds Ratio CI:Confidence interval AIC:Akaike's Information Criterion

months frequently acted violently against staff, and physical violence tended to intensify and exacerbate in patients who had been hospitalized for more than three months. As shown in the model suggested by Nijman,²⁵ initially patients may feel uncomfortable when they are with other patients with severe psychiatric symptoms, and may react against the care being given by staff; viz., this feeling may have enhanced by the hospital environment.

Regarding the risk factors, it has been suggested that there is a higher risk of violence in males.²⁶ In this study, we found no significant difference between the two sexes; however, females tended to show physically aggressive behavior more frequently than males, and staff represented more than half of the targets of female violence. This may suggest that Japanese females are more likely to engage in physical violence, or that staff do not consider verbal violence by females to be a major issue, because such violence does not pose a grave threat to them. A past history of violence is one of the strongest relevant factors to violence,²⁷ and our results led to the same conclusion. Therefore, a history of violence is a potent contributing factor to violence in Japanese psychiatric wards.

Assessment of psychiatric symptoms using the BPRS showed that VG patients had advanced symptoms in subitems other than negative symptoms. Assessment of social skills using the LSP indicated that the VG patients had lower skills in all subitems, including items used to assess rule compliance, such as “acting violently”, “arrogant and aggressive behavior” and “destruction tendency of furniture”. These items assess the presence of violence itself, rather than the ability to live within certain regulations. Therefore, it is understandable that the VG had significantly lower scores on these subscales. Poor ability at “joining in a conversation” and “not cutting in on others’ conversations” as included in the subitem “communication”, in “making friends” as shown in “socialization”, and in “providing care in cooperation with staff” as included in “responsibility”, are also thought to be associated with violence. Krakowski et al.²⁸ have evaluated social skills by monitoring activities, grooming and appearance, recreation, and human relations during group activities, and reported that

violence could be reduced by improving these skills through treatment. In other words, skills such as socialization and communication are important items for establishing interpersonal relationships, and improvement of such skills may be an effective interventional method.

The multivariate logistic model suggested that patients with a past history of violence, no negative symptoms, dysphoria, and a BVC score of 1 or more were likely to be violent. Both physical violence and other types of violence were included in the study, and violence was examined not only in secure units and PICUs (in which there is thought to be a higher risk of violence) but also in other wards. Therefore, our results should be applicable to many common psychiatric wards. However, we must stress that predictive results should not be used as a standard to determine isolation or confinement of patients, and that it remains important to practice violence prevention through appropriate care interventions, such as de-escalation before a violent incident can occur.

Our definition of violence included both physical and verbal violence, and the study encompassed many kinds of closed psychiatric wards. Therefore, special wards for acute psychiatric patients, alcohol/drug abusers, and adolescents were not separately evaluated. In addition, background data was limited to only clinically available information, and an assessment of potential personality disorders was not performed. Further investigations are needed to determine the risk factors of each diagnosis.

Acknowledgement

The authors would like to thank our late Professor Kunihiro SHIOE for his dedication in guiding us on the present study while we were graduate students in our department.

References

1. Lee S, Wright S, Sayer J, Parr A, Gray R, Gournay K. Physical restraint training for nurses in English and Welsh psychiatric intensive care and regional

- secure units. *Journal of Mental Health* 2001; 10: 151-162.
2. Paterson B, Duxbury J. Restraint and the question of validity. *Nurs Ethics* 2007; 14: 535-45.
3. Stubbs B, Leadbetter D, Paterson B, Yorston G, Knight C, Davis S. Physical intervention: a review of the literature on its use, staff and patient views, and the impact of training. *J Psychiatr Ment Health Nurs* 2009; 16: 99-105.
4. Harris G, Rice M, Quinsey V. Violent recidivism of mentally disordered offenders: The development of a statistical prediction instrument. *Criminal Justice and Behavior* 1993; 20: 315-335.
5. Steadman H, Mulvey E, Monahan J et al. Violence by people discharged from acute psychiatric inpatient facilities and by others in the same neighborhoods. *Am Med Assoc*, 1998; 393-401.
6. Bonta J, Law M, Hanson K. The prediction of criminal and violent recidivism among mentally disordered offenders: a meta-analysis. *Psychol Bull* 1998; 123: 123-42.
7. McNiel D, Binder R. Correlates of accuracy in the assessment of psychiatric inpatients' risk of violence. *Am Psychiatric Assoc*, 1995; 901-906.
8. Hoptman M, Yates K, Patalinjug M, Wack R, Convit A. Clinical prediction of assaultive behavior among male psychiatric patients at a maximum-security forensic facility. *Psychiatric Services* 1999; 50: 1461-1466.
9. Nijman H, Merckelbach H, Evers C, Palmstierna T, a Campo J. Prediction of aggression on a locked psychiatric admissions ward. *Acta Psychiatrica Scandinavica* 2002; 105: 390-395.
10. Bjorkly S., Hartvig P., Heggen F.A., Brauer H. & Moger T.A. Development of a brief screen for violence risk (V-RISK-10) in acute and general psychiatry: an introduction with emphasis on findings from a naturalistic test of interrater reliability. *European Psychiatry* 2009. 24(6):388-394.
11. Almvik R, Woods P, Rasmussen K. The Broset violence checklist: Sensitivity, specificity, and interrater reliability. *Journal of Interpersonal Violence* 2000; 15: 1284-1296.
12. Woods P, Almvik R. The Broset violence checklist (BVC). *Acta Psychiatrica Scandinavica* 2002; 106: 103-105.
13. Abderhalden C, Needham I, Dassen T, Halfens R, Haug H, Fischer J. Predicting inpatient violence using an extended version of the Broset-Violence-Checklist: instrument development and clinical application. *BMC psychiatry* 2006; 6: 17.
14. Bjorkdahl A, Olsson D, Palmstierna T. Nurses' short-term prediction of violence in acute psychiatric intensive care. *Acta Psychiatrica Scandinavica* 2006; 113: 224-229.
15. Nijman H, Palmstierna T. Measuring aggression with the staff observation aggression scale-revised. *Acta Psychiatrica Scandinavica* 2002; 106: 101-102.
16. Kitamura T, Machizawa S, Maruyama S et al. Test-retest reliability of Oxford University version of the Brief Psychiatric Rating Scale (BPRS): a preliminary survey of multicentre collaborative study initiated by the National Institute of Mental Health. *J. Ment. Health* 1985; 32: 1-5. (in Japanese)
17. Hasegawa K Ogawa K. The reliability and validity of the Japanese version of the life skills profile. *Seishin Igaku* 1997; 39: 547-555. (in Japanese)
18. Palmstierna T, Wistedt B. Staff observation aggression scale, SOAS: presentation and evaluation. *Acta Psychiatrica Scandinavica* 1987; 76: 657-663.
19. Hallsteinsen A, Kristensen M, Dahl A, Eilertsen D. The extended staff observation aggression scale (SOAS-E): development, presentation and evaluation. *Acta Psychiatrica Scandinavica* 1998; 97: 423-426.
20. Nijman H, Muris P, Merckelbach H et al. The staff observation aggression scale-revised (SOAS-R). *Aggressive behavior* 1999; 25: 197-209.
21. Tsuruta S. Violence in chronic schizophrenic patients. *Seishin Igaku* 2002; 44: 33-38. (in Japanese)
22. Monahan J, Steadman H, Appelbaum P et al. Developing a clinically useful actuarial tool for assessing violence risk. *British Journal of Psychiatry* 2000; 176: 312-319.
23. Wakimoto Y Sakai Y. A discussion regarding the closed ward in a psychiatric hospital (second report). *Kyushu Neuropsychiatry* 1997; 43: 99-108. (in Japanese)
24. Wright S, Gournay K, Glorney E, Thornicroft G. Dual diagnosis in the suburbs: prevalence, need, and in-patient service use. *Social Psychiatry and Psychiatric Epidemiology* 2000; 35: 297-304.
25. Nijman H. A model of aggression in psychiatric hospitals. *Acta Psychiatrica Scandinavica* 2002; 106: 142-143.
26. Steinert T. Prediction of inpatient violence. *Acta Psychiatrica Scandinavica* 2002; 106: 133-141.
27. Steinert T, Wiebe C, Gebhardt R. Aggressive behavior against self and others among first-admission patients with schizophrenia. *Psychiatric Services* 1999; 50: 85-90.
28. Krakowski M, Jaeger J, Volavka J. Violence and psychopathology: a longitudinal study. *Compr Psychiatry* 1988; 29: 174-81.